July, 1956

THE CHEMIST

VOLUME XXXIII NUMBER 7

Dr. Benjamin D. Van Evera, F.A.I.C.

Receives Honor Scroll of Washington AIC Chapter

(See Page 289)

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TO COME IN AUGUST

It is pleasing to see recognition come to one who has worked long and faithfully for the Institute and for the profession in his area. The presentation of the Louisiana Chapter's Honor Scroll to Harold A. Levey of New Orleans, this Spring, typifies such an occasion. Mr. Levey's activities will be covered in the August Chemist. "Psychological Studies of the Characteristics of Scientists," by Dr. Mary D. Rootes, associate professor of psychology at Newcomb College of Tulane University, contains some interesting observations which she hopes "may have possible bearing on plans for recruitment and training of promising young people."

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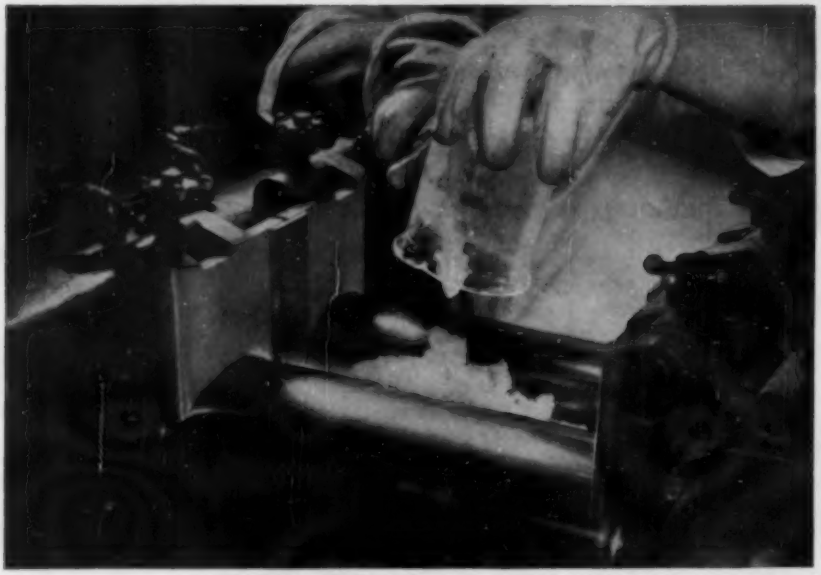

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EDITORIAL

Gain the Rich Yield of Experience

Vera F. Kimball

FOR A LONG TIME, THE AMERICAN INSTITUTE OF CHEMISTS has called attention to the waste of scientific talent that follows when the arbitrary customs of retiring the employed at age sixty-five and avoiding the employment of those past forty are followed. These customs, which became strongly established during the depression years, were devised to spread work among more young people and were rationalized with all kinds of superficial thinking to conceal their real motivation. Today, when scientists are so much in demand, why should industry not gain the rich yield of experience? Insurance laws based on statistical factors dealing with age seem formidable obstacles, but as the outmoded statistics are slowly brought up-to-date, the insurance laws of the future may be more consistent with reality, and in the meantime, there are ways to get around the obstacles, if they are a recognized hindrance to valuable gains.

Wherever there is established custom, its inertia is so great that it cannot easily be changed even though a much more desirable situation would follow. But there are also ways to implement a change in customs. Enlightened individuals and groups must continually call attention to the benefits that would follow the change.

The public is now beginning to think about the wasted abilities of those over sixty-five (and over forty), as shown by the following editorial taken from *The New York World-Telegram & Sun*, Oct. 26, 1955:

Retirement at 70

Does it make sense, in this day of lengthening life spans, to force a man to retire at 65?

We think not — and we second a recommendations made at the Governor's conference on problems of the aging that employers consider making it 70.

We're talking about *compulsory* retirement. Naturally, provision should be made for optional retirement earlier for those who need or want it.

But this business of compelling an employee to step down at 65 is a custom honored only by time, not logic.

Not only does it often breed personal unhappiness and hardship — it also adds up to a tremendous economic waste for employers.

When a man with the desire and capacity for at least five more years' competent work is benched at 65 because of some outdated company rule, it's a loss to the employer as well as the individual. It's throwing away the richest yield of a long-term investment.

By the same token, the custom of snubbing applicants over 40 is equally unjustified. It's ridiculous to consign to the scrap heap a man or woman who, by today's standards, has a productive potential of 30 years or so.

We're not unaware that pension plans militate against 40-plus applicants. But we think it's time for some up-to-date adjustments there, too, making pension benefits more flexible.

The Governor's conference will have

served a vital purpose if it helps shatter obsolete notions which prematurely label as "too old" millions of people who simply aren't.

Similar public interest will in time serve to make the modification of employment customs easier. Scientific and professional groups have long been united in their opposition to the waste of mature scientific talent.

Currently, the AIC Committee on Manpower is preparing a report on the employment of chemists over forty. (See THE CHEMIST, June 1956, p. 195) Readers of THE CHEMIST are asked to assist the committee by sending their experiences or comments to Dr. George L. Royer, chairman of the Committee on Manpower, c/o American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.

SPECIAL ANNOUNCEMENTS

Greetings to the Society of Chemical Industry

AIC president, John H. Nair, will present a Scroll of Greetings from the AIC to the Society of Chemical Industry at its Seventy-fifth Anniversary Meeting being held in London, England, July 9-14th.

The scroll, prepared by Dr. Foster D. Snell, F.A.I.C., reads:

The members of The American Institute of Chemists congratulate the Society of Chemical Industry on its seventy-five years of fruitful service, offer best wishes, and express their confidence that through the science of chemistry, it will continue to bring great benefits to the world.

Dr. Snell, past president of the AIC, and Dr. Henry B. Hass, AIC president-elect, will also attend the Meeting.

Chicago Chapter to Honor Dr. Hall

Dr. Lloyd A. Hall, F.A.I.C., technical director, The Griffith Labs., Inc., Chicago, Illinois, will receive the 1956 Honor Scroll of the Chicago AIC Chapter, at its meeting on October 5, 1956. Dr. Hall, past chairman of the Chapter, was cited "because of his intense interest and influence in promoting truly professional attitudes and constructive actions in the profession . . . his enthusiasm and positive direction in guiding . . . the professional growth of young chemists, his active participation and recognized leadership in both civic and technical organizations, and because of his outstanding technological accomplishments in industry."

Appointed: James Kilmer as advertising manager at Fischer & Porter Co., Hatboro, Pa.

The Federal Government and Education

Dr. Benjamin D. Van Evera, F.A.I.C.
Coordinator of Scientific Activities, The George Washington University, Washington, D.C.

(Acceptance address when the author received the Honor Scroll of the Washington AIC Chapter, April 24, 1956, Washington, D.C.)

THE Federal Government has grown in the past century into a colossus that dominates all facets of our lives. . .

Our founding fathers made provision in our Constitution for the education of our country's youth by reserving that function to the states, but the creeping centralization of the federal government is slowly altering that situation. No suggestion appears of Government subsidy for college education, probably because these men had themselves gone to the private liberal arts colleges which even then dotted the colonies. The education these men received must have been unusually good, for I doubt if ever in history were so many great political thinkers gotten together as there were in our Constitutional Convention. The government that these men created has endured longer than any other government in modern times, largely because of its remarkable flexibility.

As must happen, this flexibility has led to changes which have sometimes hurt, as the farmers' spokesmen are now letting us know. This widespread Federal government is now infringing upon education, particularly collegiate education. . .

The great strengths of our American collegiate educational system have been two—its independence and its variety. The individual professor has in all truly great colleges been free to pursue the truth where he found it and to teach it as freely. In a few cases university administrations have attempted to muzzle professors because of social or political pressure. You have no doubt heard about the ex-professor of nutrition in the university of a prominent agricultural state who did a good bit of research on the comparative nutritive value of oleomargarine and butter and showed that if there were any difference it was in favor of oleo—and then published his results. This made the dairy farmers mad and the soy bean farmers failed to come to his rescue, so he was fired. Such cases, while comparatively rare, do occur, which is why the academic freedom of the professor is considered to be one of the cornerstones of our educational system.

May I here pay tribute to a man who has protected academic freedom in a practical way. . . Whether he be a professor of history recounting the stormy conflicts between religions, or a professor of political science discussing the conflicting philosophies of our

two great parties, or a professor of geopolitics trying to present objectively the conflicting ideologies of the Communist world and our own, no staff member of The George Washington University in the past three decades has had occasion to feel that the university administration ever tried to hamper his honest efforts or knowingly allowed any outside agency or group to put pressure upon him. Dr. Cloyd Heck Marvin, the president during these years, has been unswerving in his adherence to that principle.

This independence of the colleges has led to the development of a variety of approaches to the educational objective. Antioch College, the University of Cincinnati, the George Washington, and the American Universities, have each approached the problem of the employed student in different ways, all with quite good results. Brown University has so changed the teaching of chemistry that it gives organic chemistry in the first year, before inorganic. The University of Chicago has experimented with the use of an examination system as a supplement to the regular program of courses. These and other examples of educational experimentation all are the result of the independence of the colleges, which has led to the variety of atmospheres, of approaches, and of courses that give the colleges their second strength. . .

Government Contact with Education

The federal government's contact with education comes in many ways. There is government sponsored research, millions of dollars worth of it. There is support of specific educational programs, for example, the training of Air Force officers in management. There is the ROTC program, which introduces into the university a department over which the university has no control of staff membership, course content, or quality of instruction. There is the security program and its effect on the inquiring mind of both the student and the professor. There are the policies of the selective service—or lack of policy, which throws such a shadow over two years of each male adolescent's life that many do not go into professional work, but get jobs to hold them until they are called or not called—and so time slips away until the desire to go on to school is replaced by regret at not having gone on to school. There is the taxation philosophy of this government and its effect upon gifts to educational institutions, and finally there is federal support for education.

Governmental support of research in universities is generally of two types. One type supports the research program of the university professor, providing assistants, equipment and supplies needed. This is now used as

a means of subsidizing graduate students. . .

In the second type of governmental research support, the university is asked to do research in specific areas. The University of California thus has its great Radiation Laboratory; the Johns Hopkins University, the Applied Physics Laboratory, and The George Washington University, the Human Resources Research Office, and projects in Army and Navy logistics. The government knows the universities have the know-how and, even more important, the understanding of research needed to assemble, organize, and operate the staffs which do the work.

Restrictions on Research

This situation would seem fine. But let us take a closer look, first, at the research which supports a professor's research program. While the project is one proposed by the professor and so is one he wants to work on, it still was not an entirely free choice. It had to be approved by the government office granting the money. That meant that the professor had to propose a problem that the office would approve. If it were a Defense Department office, someone had to dream up a possible use for the results. . . The professor, then, has lost part of his freedom of study, which is one of the strengths of our educational system. Though it may not be much of a restriction, it should be remembered that where freedom is concerned, any loss is too much. The government thus controls basic research by supporting some lines and not others.

Second, support may be cut off at any time by administrative action or by Congressional inaction. Grants are made for one year, and for a man to organize a research group and start on a four or five year program is, under such conditions, an act of faith the like of which has not been seen since the days of the Christian martyrs. The fact that relatively few projects are cut off abruptly does justify that faith, but there is enough uncertainty to make many men hesitate to start any but short term projects. The concept of granting funds to even a well-known scientist just for "research", with no restrictions, has yet to be effectively introduced into Government support of research. The government will not get the maximum returns from its research dollar until such a plan is adopted. If each member of the National Academy of Sciences were to be allowed to name one young scientist every other year to receive a government grant of $10,000 per year for five years to buy equipment and to hire assistants to pursue research as he wished, I predict the results would be phenomenal.

This year-by-year support of research is a real Achilles heel in the country's whole program. The great motivating drive in back of Congressional support of research, both developmental and fundamental, is fear. Russia is making great strides industrially or militarily and may soon pass our production rate. . . Out of

this fear, when the fog of oratory has blown away, comes support for research, almost always for a period of one year.

It has been fifteen years since the National Defense Research Committee started supporting research for national defense. There is a whole generation of research scientists who have spent all their working lives on government research contracts. In this time, they have built up some equity in social security; they may have created a fine impression with the companies holding the contracts on which they work, but their professional reputations are limited because their work has been classified and so the readers of their reports are limited in number and they have no real security in their positions.

Future Outlook

We all hope that the international tension will ease and that we can start spending our money on Cadillacs instead of tanks. When that day comes, Congress will stop the flow of funds to much of the research it now supports. Research of the Department of Agriculture and of the National Institutes of Health will continue, because one is supported by a large block of votes and the other continues the war against disease and everyone is against disease. But the research program of the Defense Department will be cut sharply and the defense aspects of the AEC's research will receive critical review.

One would hope that the program of the National Science Foundation would be expanded, but a candid view tells us that this body was founded as a result of the fears we referred to before; that congressional support for it has been niggardly, and that this has been justified in part by the great expenditures in the defense departments. I would be surprised if Congress would support that agency to anywhere near the extent it should. Agriculture does something for the farmers, N.I.H. does something for the sick, so both can be justified politically. I do not see a corresponding political group to force support of the National Science Foundation under such conditions.

This generation of scientists I referred to will be the chief sufferers when the day comes. They will be resettled elsewhere. But a Damocles' sword does hang over their careers and this uncertainty makes long-range planning more difficult. Many of these men are aware of this precarious state of their affairs and those that can are accepting positions with some tenure.

Effect of Taxes on Gifts

Let us consider the effect of high taxes on the rich on educational institutions. All institutions of higher education need gifts to support their expansion programs, the research programs of their professors, and even of their day-to-day operations. The alumni drives from state supported

schools are nearly as vigorous in their pleas for funds as are those from private schools. The reason for the appearance of the alumni drive, aimed at the $10 to $100 size contributions, is the disappearance of the wealthy class that would give $10,000 to $100,000,000 contributions. The days when a Dr. William Rainey Harper could convince a John D. Rockefeller to give millions to build the University of Chicago are apparently gone. The reason is income taxes. Now it is being proposed that the federal government subsidize education.

This is wrong and wasteful. It is wrong because it means that eventually government will call the tune on everything in the schools. The government subsidized the roads and now roads must be built to federal specifications whether a road needs to be built that heavily or not, or whether the right-of-way needs to be 120 feet wide or not. The government subsidized housing, and so standardized are the housing specifications that individual desires are almost impossible to meet if federal backing is to be obtained. The government subsidized the building of hospitals, and set mandatory standards which increased the cost of construction and consequently helped increase the cost of hospital care. If the government starts subsidizing schools, it soon will be exerting influence on them all the way from building design to diploma design. . .

Government Subsidy of Education

This direct government support of education is not desirable, because it will lead to loss of independence and freedom, controls, and increased costs caused by these controls. Also, the dispersal of funds will require an elaborate organization to lobby the annual budget through Congress, then to set up a plan to disperse the funds, and finally to inspect to be sure that the conditions set by Congress are met, for if Congress does not set conditions on how this money is to be spent by the recipients the first year, it will the second year.

As an example of how government funds affect educational institutions, let us return to the contract research done by universities. These contracts always call for the university to operate under its established policy, yet there is always pressure on the university to alter its policies to suit the whims of the auditors. This applies to all phases of the operation, and has caused so much concern that the American Council on Education has had a committee, under President Hancher of the State University of Iowa, study this problem. Fundamentally, the problem is of a requirement that the university adopt administrative procedures that are more expensive than are needed in order to accomplish the tasks to be done. In all such demands on The George Washington University no inference has ever been made that our existing

system was not working well and that government funds were not being conserved. The changes were demanded because they would be "better" and the definition of "better is that it costs more money. If the government in a field that is only a relatively small part of the University's activities can raise the fuss that it does, what fuss and what demands will be made if the government gives funds to be used in support of the whole operation? It is fighting demands like this which take the time of the research director and the administrative officials; fighting which does not help the work, but must be done while more important matters wait; work which costs the government money for which the government gets nothing. These things cause university administration to hesitate whether to perform its patriotic duty and accept such contracts.

The government also touches educational institutions on the academic, as well as on the research, side. It provides fellowships particularly through the National Institutes of Health, the AEC, and the National Science Foundation, to aid in the training of graduate students. It asks universities to set up training programs, such as the training of naval officers in comptrollership or air force officers in management. Usually the faculties are the regular members of the university staff, and the course is under the complete control of the university. If there are only a few of these programs, they can be sandwiched in among other courses and curricula and be taught by the regular staff. But if they be many or large, special divisions must be set up and the problem of tenure arises.

Suppose, after a large program has been operating for several years, the service decides to discontinue it. What is the university to do with the staff who handles this program? In the normal operation of a university, whole classes do not just disappear, so it is possible to provide tenure—that is the certainty of a job—for scholars above certain ranks. But in this abnormal operation, at any time the whole clientele may fade away. A university cannot afford to give tenure to personnel in such positions. This complicates the situation, though it does not make it impossible.

ROTC Programs

Many schools also have ROTC programs over which they have no control. The staff are appointed, are paid, and are responsible to the service. They teach courses set up by the service and leave at the command of the service. The university accepts and controls none. These units are probably necessary to assure some educational continuity for young men, and therein lies one of the evils of the system, for by threat of removal of the unit the service is able to require the university to make adjustments in its regulations or standards which it would not make voluntarily. The

university has no responsibility for the staff if the program is cancelled, but neither does it have control of the program.

Selective Service

Closely related to the ROTC program is selective service. The present operation of selective service is creating terrific problems among the young. Some believe that one of the reasons why so many young men are reluctant to go into the sciences and engineering is the uncertainty of when they are to be required to spend two years in uniform. We impress them with the difficulty and length of the scientific course and they do not relish the idea of a two-year hiatus in the program, or two years when they finish it. So they either put off all education until called or start in some more easily interrupted curriculum.

To those of us who have reached the age where the years zip by like the bullets in a Western movie, two years is a short time. But at the age of seventeen or so, two years is an eon. America is not doing right by our young men in making them face a certainly uncertain two years before they have devoloped the age and philosophy to bear that uncertainty. It would be far better if all were required to spend two years in the national service. They would know then what they had to do after high school, and this worrisome void would be avoided.

If it seems that I think of government as all bad, I have not so intended it. Social change is a strange thing, and the forces and instruments of that change are not well understood. About all one can do is stand on the sidelines and cheer when he likes what he sees, and yell to high heaven when he does not. I do not like a great deal of what I see, and I am particularly concerned lest the universities lose the independence without which they would cease to be great. The great schools have been the private ones and those state universities and colleges which have been furnished funds by the state with a minimum of interference by the state. . .

Suggestions

For support of fundamental research, I have already made a suggestion regarding younger scientists; give them grants instead of contracts. The contract can be justified only as a means of making sure that the government gets its money's worth. In research, a contract will not do this. The results of research are too ephemeral. The research report (which is what the government gets for its money) can too easily be composed of words with little meaning, or the research can simply be marked off as unsuccessful, for any contract to guarantee that the government gets its money's worth. The National Institutes of Health recognize this and give grants—grants in which the investigator is instructed to depart from his proposed outline of work if other

lines open up which show greater promise than those originally suggested. If this system used by the NIH were adopted throughout the government wherever fundamental research is involved, the savings would be enormous and the research output would increase surprisingly.

With regard to the support of education generally, I have a more complicated suggestion. There are two ways in which a government can get things done. The first, and the one most used until recently in this country, is to create an atmosphere in which the citizens will want to do it, and will do it. The second, and more expensive, is for government to do it itself. In addition, this means central government controls of the operation in considerable detail. Both have been demonstrated many times, and for education this is not good. It may be claimed that the land grant colleges suffer no control in connection with funds under the Morrell Act. Of this I have no personal knowledge, but conversations have indicated that the answer depends upon whose point of view is being expressed.

To get adequate financing for education without Federal government control, I suggest: First, it must be decided that some portion of the national income is to be given to the schools. (The word school in its broadest generic sense, here, includes colleges, universities and school districts.) Second, an estimate of the need, in round numbers, must be obtained. The National Educational Association, the associations of colleges and universities and the Department of Education should be able to answer this. Third, Congress must then decide whether it can afford to give up that much income from taxes, and if not, what fraction of the total it can give up. Once the amount Congress thinks we can afford to put into schools is determined, the following mechanism must be set up:

First, a formula for determining each school's portion of the available funds must be prepared. This could be arrived at by a conference of university representatives, officials of the associations and of the Department of Education, and any others the Congress or the President may appoint. No formula arrived at would be perfect, but it could be amended annually and it would become better as experience accumulated. It may be noted that however funds are to be given the schools, a formula must be developed.

Second, Congress would have to pass a law authorizing the schools to accept gifts from the public up to the amount indicated by the formula, and to issue as receipts therefor a form similar to the W-2 receipt which employers now issue to employees for income tax deducted. The person giving the money and receiving the receipt then would attach this receipt to his next income tax blank as part payment on his income tax.

Note that this money does not become part of his contributions to be deducted from income before computation of his tax, but replaces part of the tax itself. The advantages of this are obvious. First, we would be returning to the idea of private initiative doing the job. Second, we would be leaving control of the development of the school, within the funds available, right where it has always been and where it belongs: with the school administration. No starry-eyed individual from outside the school would then tell the school how these funds have to be spent. Third, we would be getting the money from the man who has it to the school that needs it, promptly. I predict that if Congress passed this legislation, within six months every school in the country would have its quota and could start correcting its shortages at once.

This plan not only would get the money to the unit that needs it, but the only control would be fiscal, and that a burden to no one. Present accounting machines could take these receipts, code them, and total the amount claimed for each school in a short time. And if some school accepts more than its quota, a penalty such as decreasing next year's quota could be assessed automatically. The plan could be expanded to include support of the research of young scientists, to the building of hospitals, and to the support of other worthwhile projects, which in the days before high taxes, obtained their chief support from gifts.

Education is the life-blood of democracy. This country has set out to provide education for a greater portion of the population than has ever been done before. The principle of independence of thought and freedom of experimentation must be preserved if this education is to be kept from bureaucratic control, with all the lack of flexibility that that implies. It would be a terrible thing if our education became so standardized that all colleges gave the same courses, yet that could happen under control of education by the Federal government. Knowledge is not naturally divided into courses of three credits each. Freedom to vary the presentation of knowledge is needed if our educational system is to remain virile.

A monopoly in education, whether by government or by private school, is worse than a monopoly in steel, for in education there is no profit motive and it takes years for poor education to become apparent. For this reason, the federal government influence on education must not be allowed to become a dominating or monopolistic influence. If the freedom of the American citizen is to be maintained, the freedom of his education must also be maintained.

Moved: The Chemicals Division sales office of Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Co., to Suite 100, 13212 Shaker Square, Cleveland 20, Ohio.

Dr. Van Evera, Dr. Milton Harris, Paul E. Reichardt, and George W. Irving, Jr.

Presentation to Dr. Van Evera

DR. Benjamin D. Van Evera, F.A.I.C., Co-ordinator of Scientific Activities, The George Washington University, Washington, D. C., received the 1956 Honor Award of the Washington AIC Chapter, at a dinner held April 24, 1956, at the Tally-Ho Restaurant, Washington, D.C.

Paul E. Reichardt, president of the Washington Chapter, presented the award. Dr. Milton Harris of Harris Research Laboratories presided as master of ceremonies. Dr. George W. Irving, Jr., deputy administrator, Agriculture Research Service, U. S. Department of Agriculture, introduced Dr. Van Evera.

Dr. Van Evera, born May 28, 1901, in Davenport, Iowa, received the B.S. degree from Coe College in 1923, the M.S. degree from Iowa State College in 1925, and the Ph. D. from the State University of Iowa in 1937.

He came to The George Washington University in 1925 as instructor in chemistry, and advanced to assistant professor of chemistry, associate professor of chemistry, professor of chemistry (1938-present), executive officer of the Chemistry Department (1931-42, 1945-47), coordinator of scientific activities, (1946-present) and member of the Graduate Council (1946-present.)

During World War II, he was on leave to represent the university as official investigator at the Allegany Ballistic Laboratories, Cumberland, Maryland, where many special weapons, including the bazooka, were developed.

The Graduate Council of The George Washington University, of which Dr. Van Evera is a member, offers a program of advanced study and research leading only to the degree of Ph.D. It gives personal supervision to a limited number of students, each of whom has his own consultative committee, examinations, and research direction. Dr. Van Evera is in charge of Physical Chemistry: Solubilities.

He also serves in a liaison capacity between the science department and various Government departments, private institutions, laboratories, and agencies.

In 1952, he was awarded the D.Sc. degree by Coe College in recognition of his accomplishments in teaching and research. In 1953, he served as consultant on fertilizer with a Mission of the Indian Government in making a four-month world wide survey of fertilizer plants under the auspices of the National Research Council and the Technical Cooperation Administration (Point Four Program).

Dr. Van Evera has been active in technical and professional societies. He was president of the Chemical Society of Washington (Washington Section of the American Chemical Society) in 1947. He was associate editor of the Journal of Chemical Education from 1949 to 1955. He belongs to Alpha Chi Sigma, Phi Lambda Upsilon, Sigma Xi, Omicron Delta Kappa, the Cosmos Club, the Washington Academy of Sciences, the Chemical Engineers Club of Washington, and the American Association of University Professors.

The citation on the Honor Award to him reads:

To

Benjamin Douglass Van Evera

in recognition of his effective contributions to the field of chemical education, both as teacher and as administrator.

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Established: By Armour Research Foundation of Illinois Institute of Technology, Chicago, Ill., the European Technological Observation Group plan, a service offered to non-competing firms interested in ideas of potential value in the American market. A staff of five engineers, headed by Herbert B. Gausebeck, F.A.I.C., manager of European operations, serve as observers in the fields of mechanical, electrical and chemical engineering, metallurgy, and chemical production, with headquarters in The Hague, Netherlands.

Honored: By election as Fellows of the New York Academy of Sciences, the following AIC Fellows, in addition to those previously mentioned in THE CHEMIST: Dr. Arthur Cherkin, vice president, Don Baxter, Inc., Glendale, Calif.; Dr. Ronald M. Ferry, professor of biochemistry, Harvard University; Dr. Lyle I. Gilbertson, director of laboratories, Air Reduction Co., Inc., Murray Hill, N.J., Dr. Robert Heggie, vice president American Chicle Co., Long Island City, N.Y.; Dr. Jasper H. Kane, vice president, Chas. Pfizer & Co., Brooklyn, N.Y.; Kenneth H. Klipstein, general manager, Research Division, American Cyanamid Co., New York, N.Y.; W. A. Lazier, vice president, Sprague Electric Co., North Adams, Mass.; Dr. Hans Z. Lecher, consultant, Plainfield, N.J.; Dr. W. H. Lycan, vice president, Johnson & Johnson, New Brunswick, N.J.; Dr. John E. McKeen, president, Chas. Pfizer & Co.; Miss Mona Oser, chief biologist, Food Research Labs., Inc., Long Island City, N.Y.; Joseph Rosin, retired, Merck & Co., Inc., Rahway, N.J.; Dr. Glenn E. Ullyot, director, Chemical Laboratories, Smith, Kline & French Labs., Philadelphia, Pa., and J. L. Yamins, assistant to the president, National Dairy Research Labs., Inc., Oakdale, L.I., N.Y.

Expanded Uses: Reported by Baird Associates-Atomic Instrument Company, Cambridge 38, Mass., for the Evaporograph, in electronics research and in the chemical process industry. The instrument records infrared radiation which is focused as an image onto an oil film, giving a thermal picture of the area in focus. Infrared radiation can be detected from a distance of several miles, if desired, or differences in temperatures over the surface of a process vessel can be thus determined. The Evaporograph was originally developed for military use. It was first demonstrated to the public in February 1956.

Communication Between Younger & Older Professionals

Francis J. Curtis, Hon. AIC

Vice President, Monsanto Chemical Co., St. Louis 4, Missouri

(Presented at the Second Professional Session, "Communication and the Scientific Professions," at the 33rd Annual AIC Meeting, May 11, 1956, Boston, Mass.)

WE are inclined to forget, oftentimes, when dealing with the problem of communications, the importance of the attitude of the receiver. Most of the emphasis is put on the communicator and his problems, little on the communicatee. Naturally, bridging the gap between young and old brings in its own particular problems in addition to those normal to communication between any two human beings or groups of them, but I believe that there is no phase of the subject which demands a two-way street approach more than this one. Over and over again the best efforts at communication fail by reason of the indifference and inattention of the communicatee.

Naturally not all of the problems of communication are of equal difficulty. News, for instance, is relatively simple and involves only the telling, and, furthermore, nearly always carries its own interest stimulus. Curiosity is a fundamental in the human race as well as in the monkeys and it takes very little effort to create interest in news. Knowledge, however, is somewhat different, although like news, it deals largely with facts, and while curiosity may be involved, it is not the most important motive. Still, even though it may be complicated, knowledge requires usually only receptivity from the hearer.

The transmission of ideas is most difficult because it involves the putting together of facts and evolving something from them. Much can depend on the choice of facts as well as the way in which they are put together. There is by no means the ease of simplicity in the communication of ideas as in other categories.

The Spread Between the Generations

As long as time, no two generations have ever seen eye to eye. As a matter of fact, if this situation did not exist there would probably be no progress and no civilization. You can visualize the ancient cave man sitting at the edge of his cave looking with scornful eyes at a youngster trying the new fangled idea of milking a cow!

The older man has learned to look all around a problem and he usually has the time to do it. Of course, we cannot credit every older person with this ability, but we really mean that

the tendency is somewhat greater. The older man has realized that there are few blacks and whites and that the world of decision consists mostly of different grays. There are few people who do not love their mothers but that's about as far as absolutes can go. The older man has usually failed to keep up with the newer knowledge and this factor is more important than is usually thought. Wisdom without knowledge can be very disconcerting.

On the other hand, the younger man has the itch to move rather than to think. There is a tendency to believe that if activity is present, progress is being made. The young man has realized that he has more facts in his possession than older people, partly because more facts are now available and partly because he has forgotten less. Whatever the situation, it builds confidence in himself and impatience with careful, time-consuming judgments. Life must be taken in hand and controlled.

These analyses show the value of having a mixed group in an organization. Many men will tell you with great pride that they have a so-called "young" organization. There is a pardonable reason for this pride in that movements will be fast, though if they are in all directions at once, the pride is not justifiable. On the other hand, pride in an old organization can be certainly dangerous, as on the average, receptivity to new ideas decreases at least linearly with age, and I have often suspected at possibly an even greater rate.

The Means of Communication

Particularly characteristic of communication between old and young are public speeches and discussions. These are a holdover from the lecture system used in schools and a hang-over from the Middle Ages when most people could not read. In public speech there is a great chance for the older man to expound his views without too much risk of contradiction. However, as a tool of communication it is gravely handicapped by the fact that so few can really give a stimulating talk. I believe that when a man gets to the age where he is invited to make speeches, he ought to take a course in speech making. You can learn to play the piano by yourself, starting with one finger, but it is lots faster with a teacher and nowheres near so hard on the unfortunate hearers. When boredom enters in, communication flies out the window and who has not been bored with inept speeches! I can say myself that I never slept so well as at the old Boston Engineers Club lecture room on Commonwealth Avenue!

When I mention publications as a means of communication between young and old, I tread on dangerous ground. There is no question of the tremendous importance of publications for the record. As far as my particular subject is concerned they are of the order of shooting your

arrow into the air—any results in this field are highly accidental. Even here, though, techniques can help to attract young readers, if they are properly understood and used. Technical writing can be just as thrilling as a detective story, but rarely is. History and reminiscence can put up a barrier between age groups that no amount of goodwill can break down.

Section meetings of technical societies are for the young. They are a continuing part of education. Unfortunately, their content is so specialized that it usually bores the old; hence, the continual cry of, "Why don't you come to our meetings?" Even with those who do go to the meetings, there is a continuous criticism of the lack of mixing. Few realize that the older man is just as shy of the younger as vice versa. It is not supposed to be so, but it is true. He hesitates to force his person on the younger people because he is afraid of boring them. They in turn are afraid to go up and talk to him. Strong committees try all kinds of schemes to mix the groups up but what happens is that committees change and effort dies.

At national meetings there is much more opportunity to do more mixing with events such as lunches, cocktail parties, dinners, and general hanging around lounges. Unfortunately, the percentage of younger professionals is lower, and with an average higher age, the problems are not quite so difficult as they are at local section meetings. There is much more opportunity for mixing programs to be held consistently at the national meetings, being handled by an employed staff who can carry out programs year after year.

I wonder whether some system could be set up, like the employment clearing houses, where men could sign up to meet certain members known to be present. It will be quickly objected that this might well become unwieldy for certain well-known personalities, and I quite agree with this objection. However, it would not be difficult to set up a quota system to limit the burden. I am convinced that for good communications, contact between individuals or small groups of two or three is likely to produce better results than any other method. Such contacts could be both on non-technical and technical subjects and it is quite likely that friendships so developed could lead to correspondence which otherwise plays a very small part in the type of communication we are discussing. It will be objected that this subject has too much of a formal-

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izing atmosphere and, indeed, it has, but so has the employee clearing house and it seems to work rather well. Maybe we should proceed more often by the old saying, that, "Something is better than nothing."

In line with these ideas, it is evident that the best kind of communition we can have between young and old professionals is a relatively private one. More and more business concerns are adopting the policy of at least annual appraisal interviews of professional and supervisory personnel by their immediate superiors. It is pretty well agreed that it has to be the immediate superior to have the interview sufficiently authoritative. In the interview, the two discuss performance, good or bad, and the reasons therefore. They usually develop proposals for correcting deficiencies and point out the good things as well as the bad. It gives the younger professional the opportunity of asking advice on his own problems, as well as information on the broader aspects of the business. This procedure may sound rather cumbersome but it must be remembered that more is being accomplished than just communication alone. If this appraisal interview system can be developed widely, it can become a useful tool to bridge a certain gap in age; the size of that gap will, naturally, depend upon the organization of the company concerned. In most cases, the gap will be relatively small.

For larger age gaps, many people have toyed with the father-confessor idea. This is one of those things which is superficially very attractive; namely, of an older man to whom the younger ones can go with their problems. In an organization we have to think of morale and of the fact that every young man is going to settle in his own mind who is responsible for his future promotions. The father-confessor is a danger to line authority and can bring confusion to the interviewee who is not sure where the control of his future lies. Difficult though it may be, and dangerous as it can be, I still feel that the father-confessor idea as a means of communication between young and old professionals has not been given as much trial as it should.

Conclusions

The key to closer relations is tolerance. Yet tolerance has usually been the result of indifference. It will be remembered that in the 16th Century many wars were fought about religion. After religion became a matter of indifference, they were fought about nationalism, and now, we seem to be more tolerant, or shall we say more indifferent, to nationalism and more ready to fight about ideologies. Our problem is, can we produce tolerance by understanding? We need a greater realization of what each age group has to give the other. The old have less energy, therefore, the young should make the overtures. Shyness exists on both sides. It would seem that private means of communications

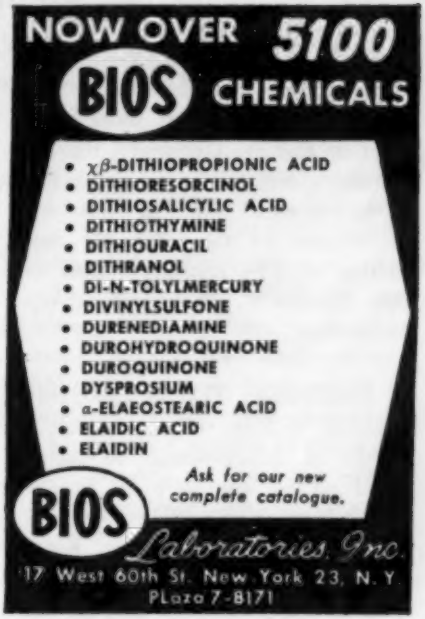
would have the best chance of success, but we must realize that there is no nice big over-all solution to this or any other part of human relations.

The accident of birth date has made the younger know more facts than the older and, therefore, left him with a greater problem of what to do with them. Knowledge of itself does not produce wisdom; digestion of it, may.

Scholarships: Available at Lowell Technological Institute, Lowell, Mass., include two at $1000 each per year (the Shapiro Brothers Factors Corp. awards) and two of $500 each (established by the Ciba Co., Inc.) Address applications to Dean Richard W. Ivers, director of admissions.

Contest: To promote greater utilization of cast steel as an engineering material, is announced by the Steel Founder's Society of America, 606 Terminal Tower, Cleveland 13, Ohio. Request information from the Society about the "Third Product Development Contest."

Appointed: Dr. Albert Bloom, F.A.I.C., as manager of the new long-range planning section just added to the Commercial Development Dep't, Dyestuff & Chemical Div., of General Aniline & Film Corp., New York, N.Y. He was formerly area supervisor in the Process Research & Development Dep't at the company's Linden, N.J., plant.



Promoted: Waldemar C. Hansen, F.A.I.C., to director of research of Universal Atlas Cement Co., 100 Park Ave., New York 17, N. Y., from manager of the Research Laboratories.

Annual Meetings: Of the American Society for Engineering Education, (Secretary: W. Leighton Collins, University of Illinois, Urbana, Ill.) are scheduled for:

1957, Cornell University, Ithaca, N. Y., June 17-21.

1958, University of California, Berkeley, Calif. (latter part of June).

1959, Purdue University, Lafayette, Ind., June 22-26.

Announced: By Dr. Jasper H. Kane, F.A.I.C., vice president, Chas. Pfizer & Co., Inc., Brooklyn, N. Y., and Dr. Lewis Webster Jones, president of Rutgers University, the Pfizer Post-Doctoral Fellowship in Microbiology of $4,500. The holder will be selected by the fellowship committee of the Graduate School on Dr. Selman A. Waksman's recommendation.

Prediction: That by 1960, polyethylene will be the first plastic to attain a billion-pound production level on an annual basis. Spencer E. Palmer, vice president of Eastman Chemical Products, Inc., Kingsport, Tenn., bases this statement on the many applications of polyethylene. Eastman produces "Tenite" brand polyethylene, in color, for housewares molders and other users. After completion of additional facilities at the Longview, Texas, plant, Eastman will produce 40,000,000 pounds annually.

Sesquicentennial Year: of Colgate-Palmolive Company, which celebrated by moving into its new home at 300 Park Ave., New York 22, N.Y., and by making a total of $500,000 in grants to 186 privately supported colleges and universities, in addition to its regular grants to projects, funds, and foundations. The company was founded in 1806 by William Colgate in New York, N.Y.

Electronics Conference: To be held Oct. 1-3, 1956, at the Hotel Sherman, Chicago, Ill. For information: J. S. Powers, National Electronics Conference, 84 E. Randolph St., Chicago 1, Ill.

Announced: By W. A. LaLande, Jr., F.A.I.C., vice president of Pennsylvania Salt Manufacturing Co., Philadelphia 2, Pa., the appointment of Thomas E. Deger as acting director of organic research.

Elected: Philip M. Dinkins as a member of the Board of Directors of General Aniline & Film Corp., New York, N.Y. He has been vice president, Operations, Dyestuff and Chemical Division, since 1955.

Appointed: Graham Barker, F.A.I.C., as industrial products technical representative of Emulsol Chemical Corp., a division of Witco Chemical Co., New York 17, N. Y. Mr. Barker was formerly senior chemist at the Newark, N. J., plant of Diamond Alkali.

Forecast: By Dr. Wayne E. Kuhn, F.A.I.C., general manager, Research & Technical Department of The Texas Company, Beacon, N.Y.: "In a few years much progress will be made in marine, industrial, automotive, railway, and other uses for the 'free-piston' engine."

The Future of The American Institute of Chemists

Dr. Ray P. Dinsmore, Hon. AIC

Chairman of the Board and retiring President of The American Institute of Chemists

(Presented at the AIC Luncheon, at the 33rd Annual AIC Meeting, Boston, Mass., May 11, 1956.)

AFTER a year as leader of the AIC, I feel impelled to make some observations with respect to our strong and weak points; all with the purpose of helping to make a better future. It is true that, in this busy age, a part-time effort is frequently inadequate and good intentions are not too often translated into substantial deeds. Under such conditions, a year does not appear to be an important period. Each of us, however, has his own opportunities to plant worthy ideas which can live and grow in fertile ground.

In the course of the year's duties, I have studied the statement of our objectives and code of ethics as set forth in our constitution and by-laws. I have visualized the earnest and benevolent individuals that produced them with such care and grammatical precision. I have tried to imagine the variations in interpretation and practice which might still fall within the limits of these stated objectives and conform to the code of ethics. Enough deviation in that professional person that we would hold up to public esteem comes to my mind to make me wish that there were a stronger undercurrent of idealism, a call above and beyond that of duty.

This is a society which has not chosen to imitate others by devoting most of its time to the discussion and publication of new developments in chemistry. It has rather endeavored to promote the welfare of the chemist, to advance the profession and to insure better treatment of the public. These are altruistic ideas. However, there are various degrees of altruism. Unselfish giving from abundance is a minor type of altruism. If you want to judge your own altruistic tendencies, ask yourself whether they result in a high degree of self-sacrifice. The use of leisure time and surplus energy for the benefit of others is in the latter category.

It is this type of idea that I would like to see sponsored and practiced by the AIC and its Fellows. For by the adoption of such an ideal, we can be assured that much will be accomplished, not only for fellow chemists, the profession, our communities, and our country, but also for the advancement of civilization.

The Ideal of Service

We should have members who are eager to do something for fellow chemists. We should not seek mem-

bers that join the INSTITUTE solely in the hope that something will be done for them. The professional idea is the idea of service—not just efficient performance for a good fee—but the utilization of one's knowledge, experience and intelligence for the good of others.

Let us then look at ourselves and see how, as a society, we measure up.

First, I shall deal with the criticism that our INSTITUTE is superfluous and performs no service that its sister societies cannot perform better. This criticism has some basis, to the extent that we might limit our activities to the publication of a code of ethics and to talk about improving the economic status of the chemist. We have done better than that by providing our members at meetings with the benefit of information and advice from experts in sociological, psychological, industrial-management, and other fields. This advice tends to broaden the outlook and usefulness of the individual in dealing with others. Professionalism has received attention. Employer-employee relations have been discussed. The young chemist, just entering industrial or other professional work, has been coached by older and experienced chemists in the best ways to tackle his new job.

The AIC Objectives

All of this is possible because we have the kind of objectives that we have and can draw upon the best talent with full assurance that the purposes are worthy of their time and effort. In this respect we have an advantage over societies which have chiefly as objectives the discussion and dissemination of technical literature, now classified and divided into relatively narrow fields.

However, we do suffer from inadequate geographical distribution which makes it necessary for members of local chapters to travel far to attend their sessions, and it gives outside speakers but small audiences in other than the largest metropolitan areas. To me, our lack of universal representation means that we either do not have objectives that appeal to professional chemists and engineers or that we have not sufficiently publicized them. I fear that both reasons apply to some extent.

Certainly, we have a great many of the leaders of the chemical profession in our ranks. But why do we not have them all? Chiefly, I think, because they do not believe that they are justified in giving up more of their crowded hours by belonging to "another society."

We can remedy this condition only by being certain that we have objectives which will appeal to the best professional chemists, high or low, and by adopting a program that will bring these objectives to the attention of them all. Too many have not heard of the INSTITUTE, or, if they have, do not have any idea of its purposes.

The usual procedure for the devel-

opment of local chapters is to subdivide as fast as they grow too unwieldy. However, I believe we should adopt the reverse procedure. If we established more chapters with smaller geographical coverage, I believe we could build up the right kind of membership to support them. It would be essential to place their promotion in the hands of able and enthusiastic organizers. It would be at least highly desirable to have an attractive set of immediate objectives to bring out the new members.

Dr. George L. Royer heads a committee which is studying the objectives of the AIC, and which will recommend changes in content or emphasis or both. This committee has evolved some interesting ideas on the possibility of dealing with the needs of the professional chemist as an individual rather than in a group. This does not preclude the promotion of idealism, as I have explained it, as a very real part of his needs.

It is my hope, moreover, that we will not overlook the opportunity of group action in the promotion of matters important to everyone. The young chemist will have his ideas of professional ethics strengthened by the association with ethical co-professionals and the pronouncements of this society and others. He will never learn the intense satisfaction that comes from the participation in a movement for professional betterment unless he is given the chance to join with others of his kind in such an effort.

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Practical Professional Activities

It is generally agreed by all who have studied the question that our dearth of good scientists stems from inadequate high-school training. Steps are being taken independently by various societies, trade associations, teachers' organizations and firms in industry, to help correct this situation. The AIC, preferably through local chapters, should participate in this. With a live program we might coordinate and lead it.

The experience open to chemists in their own communities, to learn more about the secondary school system, to get acquainted with civic leaders interested in the project, to approach industrialists in a different aspect than as an employee, can hardly be overrated. Add to this the conviction that such activities assist in the correction of a deficiency which might be harmful in the extreme to the profession, to industry, and to national defense, and the project fairly cries for attention.

The critical listener will at once

observe that, although an idealistic philosophy has been recommended, one of the first concrete suggestions for its indoctrination is to utilize the younger chemist in the development of a practical program for promoting the training of scientists. This is perhaps one of the perpetually confusing elements in human affairs. It has to do with the difference between the subjective and the objective, the question of motivation by self-interest as against the desire to benefit others without the incentive of self-profit.

There is a desirable balance between essentially selfish objectives, those obligations which arise from a well-recognized duty to help others, and the more altruistic sources of human conduct. Suffice it to say that such a balance must be struck in every important phase of man's activity. Each must decide for himself where that balance lies.

In the training of young people, to neglect an explanation of these facts is to withhold information of great importance to their achievement of the highest satisfaction and happiness. Yet an explanation alone will hardly suffice. Opportunities should be provided to practice these acts of altruism and thereby to learn from personal experience the manner and degree by which they may enrich human experience.

There appears to me nothing incongruous in our adoption of a fundamental idealistic philosophy with respect to the professional attitude, while, at the same time, actively promoting practical methods for increasing professional stature so that its worth may be individually appraised. We demand certain practical experience to ensure technical proficiency in chemistry, and provide ways of attaining it. Should we not also demand experience in and provide opportunity for the use of the professional attitude?

Is it not, in fact, by this approach that we will be most likely to gain employer recognition and public prestige? The "acres of diamonds" are in our own back yard. We have only to go out and dig to bring them to light and expose their value.

Definition of a Professional

One of the obligations which I assumed this year at the suggestion of the Council, was to develop a liaison between the AIC, the American Chemical Society, and the American Institute of Chemical Engineers, on the subject of professional development. The door has been opened. There is every willingness to cooperate. However, the matter has not made much progress for several reasons. Almost everyone agrees that the best point for concerted effort is at the level of the local section. We have had good cooperation in the New York area, but, in general, our chapters are few and scattered. We have not generally become enthusiastic about a philosophy of professionalism, as has the Council of the AIChE, who has published a phi-

losophy and is busy pursuing its implementation. Meanwhile, we are still studying the future roads we as a professional society should travel.

I quote the definition of a professional person which was adopted by the AIChE, which I hope we will either endorse or replace with a better one:

> "A professional person is an individual who with adequate training, experience, intellectual capacity, and moral integrity, effectively devotes his skills and knowledge to the service of society and his profession, in whatever assignment he finds himself, being fully sensible of the personal responsibility and trusteeship conferred by his special training."

We might hitch our wagon to a less lofty star than this. At any rate, though my term of office as president has ended, I hope to find ways to continue to promote this general idea.

Coordination

There is another need for the concerted action of really professional people, and hence another reason for the existence of a society such as this. It has to do with the social structure as a whole, as affected by the degree of coordination of scientific and industrial achievements with political management and the ability of the individual to assimilate and understand the changes in his environment.

It seems certain that there is no solution to the problems involved by employing the variously suggested methods of (a) having the business man run government, (b) having the scientist run government, (c) having the government run business and science. The reasons for this certainty do not lie entirely in observation of the many failures which these suggested methods have, from time to time, produced. The reasons derive from the fact that in each of the areas mentioned important skills and personal aptitudes are involved. Occasionally, these may all be found in one individual, but only rarely.

The skills of the scientist are needed to investigate and discover. The skills of the business leader are needed to organize and produce. The skills of the politician are needed to bring about unity of action and support of individual leadership.

The scientist (military and civilian) is learning to use rapid calculators to organize his facts and to study various combinations of conditions. He is beginning to teach the business man how to utilize these methods in his business to control and adjust its various phases. There is a need to extend these methods to the organization of sociological data for the aid of the politician

and the better understanding of the individual.

An effective approach must come by turning one's back on the ideas and prejudices of the past. One must stop condemning others for their failures, and recognize that, in some degree, his own failures are responsible. With this viewpoint the search for a remedy has some chance of success. It seems possible, at least, that the scientist must work out the method for supplying help and the common language by which its value may be explained.

Whether it is too much to expect of one small society that it adopt such pretentious and far-reaching objectives, I do not know. I am sure, though, that there is a great need for this highly professional activity and we must do our share or accept other leadership.

Thanks are due and gratefully expressed to all of you, in or out of the official family, who have given so generously of your time and encouragement in this most interesting year.

Will You Come

Oct. 5, 1956. Chicago Chapter. Dinner Meeting. Furniture Club, Chicago, Ill. Presentation of the Honor Scroll to Dr. Lloyd A. Hall, F.A.I.C., technical director, The Griffith Laboratories, Inc., Chicago. For information: Miss Rose Marie Brunetti, Armour Research Foundation, IIT, 10 West 35th St., Chicago 16, Ill.

Oct. 10, 1956. Dinner Meeting. National AIC Council and Board of Directors. The Chemists' Club, 52 East 41st St., New York 17, N. Y.

Dec. 1956. (Date to be announced). Pennsylvania Chapter. Joint meeting with American Chemical Society. For information: Dr. A. M. Immediata, International Resistance Corp., 401 No. Broad St., Philadalphia, Pa.

Dec. 12, 1956. National AIC Council and Board of Directors. Dinner Meeting. The Chemists' Club, 52 East 41st St., New York 17, N. Y.

Jan. 1957. (Date to be announced.) Pennsylvania Chapter. Presentation of the Honor Scroll. For information: Dr. A. M. Immediata, International Resistance Corp., 401 No. Broad St., Philadelphia, Pa.

Feb. 13, 1957. National AIC Council and Board of Directors. Dinner meeting. The Chemists' Club, 52 East 41st St., New York 17, N.Y.

May 21, 1957. National AIC Council and Board of Directors. Dinner Meeting. Sheraton-Mayflower Hotel, Akron, Ohio.

May 22-24, 1957. Thirty-fourth Annual Meeting. THE AMERICAN INSTITUTE OF CHEMISTS. Sheraton-Mayflower Hotel, Akron, Ohio.

Appointed: C. A. Petersen, F.A.I.C., as manager of the plant of the Central Manufacturing Co., Tyler, Texas. He was formerly manager of the Crown By-Products Co. of San Jose, Calif.

Communications

Joseph Priestley's Home

To the Editor:

At the suggestion of Dr. W. Conard Fernelius, head, Department of Chemistry, Pennsylvania State University, we call to your attention the efforts being made to rehabilitate and make available to the public the home of Dr. Joseph Priestley and maintain it as a national shrine.

. . . This home, located in Northumberland, Pa., until recently the property of Pennsylvania State University, has been transferred to the custody of the Borough of Northumberland, a small town at the junction of the north and west branches of the Susquehanna River 60 miles north of Harrisburg.

The Commissioners, appointed by the Borough Council to administer the property, are dedicated to the work of promoting this fine, old, colonial mansion of Georgian architecture, occupying an acre of landscaped ground, to the status of a National Shrine, commemorating the memory of the world famous scientist, also the most prolific writer on political and religious subjects of his time.

While his discovery of oxygen occurred in England prior to his coming to America, he continued experimental work in the crude laboratory attached to his home and carbon monoxide gas was isolated and identified here.

To accomplish this objective the commissioners feel that the public and particularly those interested in science should be informed of the present status, as considerable cooperation is required to properly refurnish and maintain this property and make it available at all times to the public.

. . . It is interesting to quote the resolution of the Board of Directors of the American Chemical Society passed in Dallas, April 8, "Voted that the board of directors on behalf of the American Chemical Society and of American chemists and chemical engineers, express to the Borough of Northumberland appreciation for its assuming title to the Joseph Priestley Home and agreeing to preserve the shrine as a lasting memorial of its original occupant."

. . . In the short time the home has been under local management, over 500 guests have been made welcome. Many of the visitors were associated with the chemical industry and represented seventeen states, France, and Nova Scotia.

From the number of inquiries that have already been received, we believe that in disseminating this information a public service will be rendered, hence this letter to you. . .

R. L. Davis, Director
Priestley Memorial Association
309 Water St., Northumberland, Pa.

Comment on Editorial

To Dr. Ed. F. Degering:

Your editorial in THE CHEMIST (April, 1956) certainly rings a bell.

Many years ago when I had the title, director of research and development, I encouraged my colleagues and did my best to eliminate frustrating factors. I was not a "director" of research, but merely an expeditor. My colleagues were all about my age and there were only 20 of them (professional people). They cooperated beautifully, and we had many expert technicians. I had two expert men secretaries who would say to the researcher, "Keyes wants a report, start dictating, I will write the first rough draft." One of these young men later studied law, became a member of the Maryland Bar and also a member of the State Legislature.

Is it any wonder that today these huge industrial research organizations have great difficulty creating the same atmosphere we had in this little group?

Remember, too, we were opening up an entirely new field (synthetic aliphatic organic chemistry). This was before Carbide & Carbon Chemicals were producing. Furthermore, we saw our president about once a week and "told" him how the company should be run . . . It is a shame our board of directors did not have our vision!

Years ago at the University of Illinois, we found out that industry wanted young potential executives, not engineering scientists. We gave them what they wanted. Today "Speed" Marvel complains that bright young people do not want to be "chemistry majors." Why should they? If a boy wishes to be a success in industry why restrict his education?

Yes, I agree with you when you imply that our good teachers are worn down by routine duties. You can't inspire others if you spend your waking hours doing

menial tasks and listening to silly arguments. You and I have seen competent deans go back to teaching and research rather than to keep going and end in a sanitarium.

Again, you are correct when you imply that both the teacher and the research director must do everything in his power to stimulate individual thinking on any problem. Joel Hildebrand believes a great teacher can do this without a direct contact with the student. I've seen Joel do it, but few others except by direct contact. All the way down the line each person must stimulate others. Again, is it any wonder our huge R & D organizations have great difficulty requiring each and everyone to take this basic attitude?

The problem of recovering some values from the man over sixty is the simplest you have proposed. If we old dodos would quit trying to run the works and merly make suggestions with the reasons for each, perhaps the younger generation would be willing to listen to us.

What annoys me now is to see my young friends make the same mistakes I made thirty years ago even after I have warned them! On the other hand, I never remember that I took anybody's advice thirty years ago. At one point in my career even text books annoyed me because they were so positive, and in a few cases I gleefully proved the author to be in error. So, perhaps I have no reason to complain about the attitude taken by the present younger generation towards me.

Yes, you did a splendid job when you wrote your editorial!

Dr. D. B. Keyes, F.A.I.C.
New York, N. Y.

"Fertile Fields for Cultivation"

To the Editor:

It is becoming increasingly apparent that, regardless of their military importance, uranium and its neighbor elements seem unlikely to furnish an economically competitive base for atomic power in the foreseeable future. There is, however, evidence that some of a series of at least 30 other atomic species, including specifically mercury and lead, may do so. That information is disclosed in U.S. Pat. App. No. 410,068, filed Feb. 15, 1954. . .

. . . It may be said with certainty on theoretical grounds alone that mercury, lead, and the nearby elements undergo fast neutron chain fission reactions. Because of its physical properties, mercury is an outstandingly desirable example. The problem of practical utilization is not greatly different from present practice, and involves:

(1) Construct a reactor possessing essentially (a) an initiating source of neutrons of proper excitation energy; (b) regulating devices to control the multiplication factor. That is easier than in the case of uranium because here only slowing down, not fairly complete absorption of neutrons, is required; (c) suitable arrangement for the conversion of the available energy to useful power; (d) general safety features.

(2) Incorporate therein, properly arranged, an amount in excess of a critical amount of one of the indicated elements, as mercury or lead. Such an amount for mercury is about 5500 pounds, and for lead about 8500 pounds. Both of these values are probably high. The excitation energy for lead and mercury is about 16 MeV but it is preferable to use neutrons of the fission value of uranium as a starter.

(3) Initiate and operate.

This summary may excite various objections, some of the more obvious of which are covered by the following:

(1) The fission of these elements is already established.

(2) Nearly every known atomic species is also known to exhibit an (n,2n) reaction. The total mechanism, however, is more obscure.

(3) The energy of the fission neutrons may be computed from the law of conservation of momentum. . . The number of neutrons is probably not greater than 3, for which a calculation can similarly be made, and in the region of lead and mercury the available energy is still amply sufficient. Experimental results agree.

(4) Exact critical sizes depend upon good neutron cross-sections and other considerations. But for practical purposes workable "critical" sizes and weights may be computed from the formulae:

$$R = \frac{6.52\,AV}{b}$$

$$W = 9.3 \times 10^{-3}\,R^3 d$$

where R is the radius of a sphere in cm.; AV is the atomic volume; b is the geo-

metric collision cross-section in barns; W is the weight in pounds; and d is specific gravity. These are likewise approximation formulae and undoubtedly yield results higher than necessary but they are, therefore, practical.

(5) The similarity of the neutron behavior of mercury and lead to uranium is striking on careful examination, and the material herein is supported by experiment.

Much more may be said in this connection but enough has been set forth to indicate fertile fields for cultivation.

—Dr. Martin Meyer, F.A.I.C.
28 East 10th St.,
New York 3, N. Y.

(*Editor's note*: Linotype limitations made it necessary to omit the supporting formulae in this letter. These will be supplied by the author on request.)

Received Award

To the Editor:

In the May CHEMIST there appeared, under the section entitled "Something New", a few lines mentioning our new ceramic grinding plates . . . For the development of these plates we were awarded the 1956 Blue Ribbon Mining Award by the magazine, *Mining World*.

—J. E. Schaub
Bico, Inc., Burbank, Calif.

"Brainpower— Our Greatest Asset"

To the Editor:

I read with interest the report of the AIC Committee on Manpower entitled, "Report to Chemists and Chemical Engineers on Scientific Manpower", that appeared in the April 1956 CHEMIST. I was particularly interested in the reference that Dr. G. L. Royer, chairman of the Committee, made to the report of Frank H. Bowles on "Brainpower—Our Greatest Asset" . . . (Where can I) get this report?

Dr. A. Ernest MacGee, F.A.I.C.
Kansas City, Mo.

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(*Editor's Note*: The proceedings of the second general assembly of the Engineers Joint Council, containing Mr. Bowles' paper, may be obtained for $1.00 from the Engineers Joint Council, 29 West 39th St., New York 18, N. Y.)

Thank You

To the Editor:

. . . As usual, you did an outstanding job in digesting the paper which I gave. ("Communications Within the Professional Society," June, 1956, Chemist.)

—Dr. Walter J. Murphy, Hon. AIC
Washington, D. C.

To the Editor:

An excellent job of condensing . . . (Interdisciplinary Communication Among Scientists, THE CHEMIST, June 1956.)

—Dr. Dwight E. Gray
Washington 25, D.C.

"The chemical industry has grown fourfold since 1939 and competent authorities estimate it will be 400 per cent of its present size by 1975, but the number of graduates in chemistry, chemical engineering or other technical fields required by this industry has not increased at anywhere near this rate and, in fact, is now decreasing."

—William C. Foster

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Aptitudes: Dr. J. Bennett Hill, director of research and development for Sun Oil Company, stated: "I would say that if a youngster is good at understanding ideas; if he is good at, and likes, mathematics and has a good object visualization, he probably has the makings of a scientist or engineer. You might watch the kind of hobbies he prefers. If he prefers a chemistry set to other toys or pastimes; if he likes to take the alarm clock or the vacuum cleaner apart (and put them back together); tinkers with the family car or old radio sets; enjoys making model cars, boats or airplanes; prefers factual reading to fictional, the chances are good he or she would be interested in learning more about a career in science."

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Opportunities

Doris Eager, M.A.I.C.

AIC members who are seeking positions may place notices in this column without charge.

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Biochemist. Ph.D., 1956, Experience in organic chemistry. Publications. Sigma Xi. Desires teaching or research in academic situation. Box 70, THE CHEMIST.

Medical Detailer. Age 26. Single. Can relocate, will travel. A.B. Biology, plus sales course. Four years experience includes serology, bacteriology, hematology, parasitology, blood chemistry. Box 72, THE CHEMIST.

Agricultural Chemist. Inorganic chemist (Ph.D. 1950). Sigma Xi. Publications. Experience: Soil chemistry, plant nutrition, inorganic and analytical chemistry, processing and preserving of fruits and vegetables. Desire research, teaching, or industrial position with a future. Box 74, THE CHEMIST.

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Research Associate in University. Organic synthesis, work under close direction. For one year only, permissible to take one course. Salary $4-5,000 on 12 month basis. B.S. minimum requirement. Box 71, THE CHEMIST.

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Something New

"Applied Solar Energy Research." Cloth or paper bindings at $5.00 and $4.00 each. Association for Applied Solar Energy, Suite 204, Mayer-Heard Bldg., Phoenix, Arizona.

"Facts Book of the Chemical Industry." $1.00. Manufacturing Chemists' Association, Inc., 1625 Eye St., N.W., Washington 6, D.C.

"Is Marketing and Economic Research Your Problem?" Booklet. Foster D. Snell, Inc., 29 W. 15th St., New York 11, N.Y.

"What's New for the Laboratory." Catalog. Scientific Glass Apparatus Co., Inc., 100 Lakewood Terrace, Bloomfield, N.J.

"Cab-O-Sil—Colloidal Silica." Technical data for use in plastics, rubber, paint and varnish industries. Godfrey L. Cabot, Inc., White Pigments Div., Boston 10, Mass.

"Engineering Data Sheet." International Instruments Inc., P.O. Box 2954, New Haven 15, Conn.

"Radiation-Shielding Windows for Nuclear Research." Package units. For information: Corning Glass Works, Corning, N.Y.

"Becco Laboratory Procedures for Pulp Bleaching." Bulletin 66. Becco Chemical Div., Food Machinery & Chemical Corp., Buffalo 7, N.Y.

"Laboratory Stirrers." Catalog sheet. Talboys Instrument Corp., 13 Ackerman Ave., Emerson, N.J.

"Midget Morehouse Laboratory Mills, stainless steel." Information. Morehouse-Cowles, Inc., 1150 San Fernando Rd., Los Angeles 65, Calif.

"Wide Range Zimmerli Gauge." Information. Scientific Glass Apparatus Co., Inc., Bloomfield, N.J.

"Labaratus", new catalog supplement. Central Scientific Co., 1700 Irving Park Rd., Chicago, Ill.

"New Variable Speed Stirrer, Model 101." Information. Talboys Instrument Corp., 13 Ackerman Ave., Emerson, N.J.

"Three-meter Concave Grating Spectrograph." Bulletin 52. Baird Associates-Atomic Instrument Co., Cambridge 38, Mass.

"Petrothene Polyethylene Resins for Plastics Molders." Booklet. U. S. Industrial Chemicals Co., Div. of National Distillers Products Corp., 99 Park Ave., New York 16, N.Y.

Condensates

Ed. F. Degering, F.A.I.C.

B-ACTH, according to Stamford Laboratories, has a molecular weight of 4566, reportedly making it the largest single protein chain of known molecular structure.

A new approach to many chemical fields is afforded by the new intermediate cyanuric chloride.

Research has indicated that the price tag on a new pesticide is of the order of one-million dollars.

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—*Mutual Moments*

Predictions indicate the use of about 20,000 pounds of rhenium annually by the electronic market.

Farmers produce so abundantly that 85 per cent of the population can now choose other kinds of jobs. During the past ten or more years, output on the farm has increased about 40 per cent with a 17 per cent decrease in farm labor.

—Wheeler McMillen

Expenditures for research in the U.S. during 1955 are estimated at over four-billion, about equally divided between industry and the Government.

This time, like all other times, is a very good one, if we but knew what to do with it.

—Emerson

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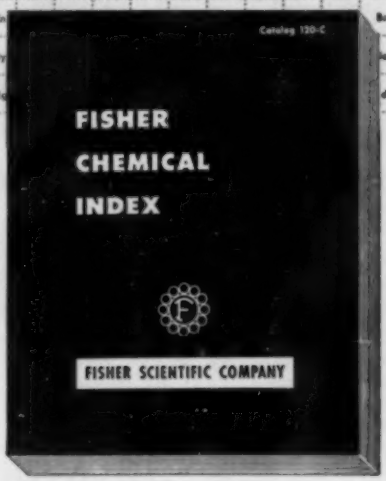

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